## REMARKS

This is intended as a full and complete response to the Office Action dated April 24, 2007, having a shortened statutory period for response set to expire on July 24, 2007. Please reconsider the claims pending in the application for at least the reasons discussed below.

Claims 11-13, 15-18, and 21-28 remain pending in the application and are shown above. Claims 11-13, 15-18, and 21-28 are rejected. Reconsideration of the rejected claims is requested for the reasons presented below.

The Examiner has objected to the phrase "A method and apparatus for depositing" in the abstract. Applicants have replaced the phrase "A method and apparatus for depositing" with "A method of depositing" as requested by the Examiner. Applicants have also corrected typographical errors in the abstract. Applicants submit that the changes made herein do not introduce new matter. Applicants respectfully request withdrawal of the objection to the specification.

Claims 11-13 are rejected under 35 U.S.C. § 103(a) as being unpatentable over *Chiang, et al.* (U.S. Patent No. 5,817,572) in view of *Sugahara, et al.* (U.S. Patent No. 5,989,998). The Examiner states that *Chiang, et al.* teaches a method of forming interconnect structures including providing a substrate (320) having a contact (321) formed therein, depositing a first dielectric layer (322) on said substrate, forming an etch stop layer (323) on said first dielectric layer (322), forming a second dielectric layer (350) on said etch stop layer (323), forming a photoresist layer (352) on said second dielectric layer (350), and using said photoresist layer to form a contact hole (351) in said second dielectric layer (350), wherein said first dielectric layer (322) and said second dielectric layer (350) may include any suitable dielectric material or materials including silicon dioxide, silicon nitride, silicon oxynitride, phosphosilicate glass, borophosphosilicate glass, fluoropolymer, parylene, polyimide, any suitable spin-on glass, or any suitable spin-on polymer (column 13, line 27-column 16, line 9). The Examiner acknowledges that *Chiang, et al.* fails to disclose using a low dielectric constant material. The Examiner notes that parylene and polyimide are known low dielectric constant materials and concludes that *Chiang, et al.* teaches upon the claimed invention. The Examiner also acknowledges that *Chiang, et al.* fails to

disclose a low dielectric constant material that is an oxidized organosilane layer. The Examiner asserts that it would have been obvious to combine the teachings of *Chiang, et al.* and *Sugahara, et al.* to enable forming a low dielectric constant layer in *Chiang, et al.* as taught by *Sugahara, et al.* for the advantage of forming a film with improved film formability and cost efficiency and because one of ordinary skill in the art would have been motivated to look to alternative suitable methods of forming the disclosed dielectric layer in *Chiang, et al.*, and art recognized suitability for an intended purpose has been recognized to be motivation to combine. Applicants respectfully traverse the rejection.

*Chiang, et al.* discloses that the dielectric layer 322 may include any suitable dielectric material or materials, including silicon dioxide, silicon nitride, silicon oxynitride, phosphosilicate glass, borophosphosilicate glass, fluoropolymer, parylene, polyimide, any suitable spin-on glass, or any suitable spin-on polymer (column 13, lines 26-31). Applicants agree with the Examiner that "including" is an open-ended term that does not exclude other, non-listed materials. However, Applicants submit that as *Chiang, et al.* does not provide any guidance regarding what constitutes a "suitable" dielectric material other than listing specific dielectric materials, *Chiang, et al.* does not suggest or motivate using a low dielectric constant oxidized organosilane layer as the dielectric material. Applicants further submit that the Examiner's observation that *Chiang, et al.* is open to different materials as the dielectric films is not sufficient to find a teaching or suggestion to use the oxidized organosilane layer of *Sugahara, et al.* as the dielectric layer of *Chiang, et al.* Thus, Applicants respectfully submit that the combination of *Chiang, et al.* and *Sugahara, et al.* does not suggest or motivate using *Sugahara, et al.'s* oxidized organosilane layer as the dielectric layer in *Chiang, et al.'s* stack of layers.

Therefore, *Chiang, et al.* in view of *Sugahara, et al.* does not teach, show, suggest, or otherwise render obvious a method comprising depositing on a substrate a plurality of layers, wherein the plurality of layers comprises one low dielectric constant oxidized organosilane layer comprising carbon, wherein the low dielectric constant oxidized organosilane layer is deposited in a plasma enhanced process from a mixture comprising an organosilane compound and an oxidizing gas and the carbon content of

the low dielectric constant oxidized organosilane layer is from 1% to 50% by atomic weight, a layer selected from the group consisting of parylene, FSG, and silicon oxide layers, and a top layer of the plurality of layers that is a photoresist, as recited in claim 11. Accordingly, Applicants respectfully request withdrawal of the rejection of claim 11 and of claims 12-13, which depend thereon.

Claims 15-18, 21, and 23-28 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Chiang, et al.* in view of *Shu, et al.* (Patent Application No. 09/019,900). The Examiner states that *Shu, et al.* teaches forming a low k dielectric layer over a substrate, wherein said dielectric layer is deposited in a plasma enhanced process from a mixture comprising a reactant species which includes carbon and silicon, such as 3-methyltrimethoxysilane, labeled methylsilane compounds, and an oxidizing gas such as $O_2$ and $H_2O_2$. The Examiner asserts that it would have been within the scope of one of ordinary skill in the art to combine the teachings of *Chiang, et al.* and *Shu, et al.* to enable forming the low k dielectric layers of *Chiang, et al.* according to the teachings of *Shu, et al.* because one of ordinary skill would have been motivated to look to alternative suitable methods of forming the second dielectric layer of *Chiang, et al.* Applicants respectfully traverse the rejection.

*Shu, et al.* describes oxidizing a reactant comprising carbon to deposit a SiOC low dielectric constant film but does not teach or suggest including the low dielectric constant film in a plurality of layers that also comprises a top layer that is a photoresist. As discussed above, *Chiang, et al.* also does not teach or suggest including a low dielectric constant oxidized organosilane layer comprising carbon in a plurality of layers. Thus, Applicants respectfully submit that *Chiang, et al.* in view of *Shu, et al.* does not suggest or motivate using *Shu, et al.'s* low dielectric constant film as the dielectric film in *Chiang, et al.'s* stack of layers.

Therefore, *Chiang, et al.* in view of *Shu, et al.* does not teach, show, suggest, or otherwise render obvious a method comprising depositing on a substrate a plurality of layers, wherein one or more of the layers is a low dielectric constant oxidized organosilane layer comprising carbon, wherein the low dielectric constant oxidized organosilane layer is deposited in a plasma enhanced process from a mixture comprising a methylsilane compound and an oxidizing gas, the carbon content of the

low dielectric constant oxidized organosilane layer is from 1% to 50% by atomic weight, and a top layer of the plurality of layers is a photoresist, as recited in claim 15. Accordingly, Applicants respectfully request withdrawal of the rejection of claim 15 and of claims 16-18, 21, and 23-28, which depend thereon.

Claim 22 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over *Chiang, et al.*, in view of *Shu, et al.* as applied to claims 15-18, 21, and 23-28 above, and further in view of *Chen* (U.S. Patent No. 5,970,376). The Examiner states that the combination of *Chiang, et al.* and *Shu, et al.* substantially teaches the claimed invention but fails to disclose the etching the low dielectric constant oxidized organosilane layer using fluorine, carbon, and oxygen ions. The Examiner notes that *Chen* teaches etching a low dielectric constant layer using fluorine, carbon, and oxygen ions. The Examiner asserts that it would have been obvious to combine the teachings of *Chiang, et al.* and *Shu, et al.* with *Chen* for the further advantage of forming vias with attenuated lateral etching of said vias. Applicants respectfully traverse the rejection.

As discussed above, *Chiang, et al.* in view of *Shu, et al.* does not teach or suggest all of the elements of claim 15, upon which claim 22 depends. *Chen* also does not teach or suggest a method comprising including a low dielectric constant oxidized organosilane layer comprising carbon in a plurality of layers, wherein a top layer of the plurality of layers is a photoresist. Thus, *Chiang, et al.* in view of *Shu, et al.* and *Chen* does not teach or suggest all of the elements of claim 22. Accordingly, Applicants respectfully request withdrawal of the rejection of claim 22.

Claim 11 stands rejected on the ground of non-statutory obviousness-type double patenting as being unpatentable over claims 11 and 16 of U.S. Patent No. 6,054,379. Applicants are submitting a terminal disclaimer in a separate paper. Accordingly, Applicants respectfully request withdrawal of the double patenting rejection of claim 11.

In conclusion, the references cited by the Examiner, alone or in combination, do not teach, show, or suggest the invention as claimed.

Having addressed all issues set out in the office action, Applicants respectfully submit that the claims are in condition for allowance and respectfully request that the claims be allowed.

Respectfully submitted,

Keith M. Tackett
Registration No. 32,008
PATTERSON & SHERIDAN, L.L.P.
3040 Post Oak Blvd. Suite 1500
Houston, TX 77056
Telephone: (713) 623-4844
Facsimile: (713) 623-4846
Attorney for Applicant(s)